

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
30 May 2002 (30.05.2002)

PCT

(10) International Publication Number  
**WO 02/42364 A2**

- (51) International Patent Classification<sup>7</sup>: C08J 5/18
- (21) International Application Number: PCT/IL01/01065
- (22) International Filing Date:  
20 November 2001 (20.11.2001)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
139910 26 November 2000 (26.11.2000) IL
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- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:  
— *without international search report and to be republished upon receipt of that report*
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

WO 02/42364 A2

(54) Title: PLASTIC FILMS CONTAINING A FRAGRANCE AND AN ODOR BARRIER MATERIAL WITHIN AND A METHOD FOR THEIR PRODUCTION

(57) Abstract: A method for producing a polyethylene or polypropylene plastic film having a fragrance and an odor barrier material incorporated into the film, comprising the steps: (a) adding a liquid fragrance to highly porous pellets of polyethylene or polypropylene polymer or co-polymer at a weight ratio of polymer to fragrance of 3:1; (b) blending the mixture at 30-40 RPM for approximately five to ten minutes; (c) adding powdered bis fatty-acid amide at a weight ratio of 3-25 %, to the above mixture; (d) blending the mixture for an additional five minutes; (e) adding polyethylene or polypropylene polymer or co-polymer, of approximate particle size of 500 $\mu$  at a ratio of 1:1 by weight, to the above composition; (f) blending the mixture for two minutes at 60 RPM; (g) extruding the resultant composition on a single screw extruder; (h) forming the composition into pellets; (i) mixing the pellets with polyethylene or polypropylene polymer or co-polymer at a w/w ratio of 50:1 to 20:1 of polymer to above composition; (j) forming a film from the pellets. A plastic film produced according to the method, for packaging or for masking unpleasant odors, comprising a polyethylene or polypropylene plastic film having a fragrance incorporated in the film is also disclosed.

## PLASTIC FILMS CONTAINING A FRAGRANCE AND AN ODOR BARRIER MATERIAL WITHIN AND A METHOD FOR THEIR PRODUCTION

### FIELD OF THE INVENTION

The present invention generally relates to plastic films containing a fragrance within the plastic material, and additionally containing a chemical composition which makes said plastic material impermeable to odors. The plastic films disclosed in the present invention are useful for masking unpleasant odors such as those emitted from waste products, for example from diapers destined for disposal or from household garbage. The films according to the present invention may also be useful for packaging any other item in order to enhance its presentation or appearance by adding a pleasant fragrance, such as cosmetic items.

### BACKGROUND OF THE INVENTION

Used disposable diapers tend to emit an unpleasant smell, as does household garbage. Most household garbage pails, or diaper pails, are not of a sophisticated nature, and so, when they are opened to add additional waste to them, the unpleasant odor of their contents is emitted.

The need exists, therefore, for a plastic bag that masks unpleasant odors, such as those emitted by dirty disposable diapers or household garbage. A garbage bag is known in the art that contains a fragrance, but the fragrance is sprayed on the bag externally at the end of the production process, thus the fragrance has an extremely short shelf-life, and so has limited success in masking odors once it reaches the consumer.

It is the object of the present invention to provide a plastic film that contains a fragrance incorporated within which is released slowly over a long period of time, and has a long shelf-life. The film is impermeable to liquids, and the fragrance will mask unpleasant odors of items wrapped in the film. The film additionally contains a chemical composition which makes said plastic material impermeable to odors, an "odor barrier". The film may be formed into a bag useful in waste disposal, or may be used in packaging of any product for which a pleasant fragrance would enhance its presentation or appearance.

It is also the object of the present invention to provide a method for producing

a polyethylene or a polypropylene film having a fragrance and an odor barrier material, incorporated within.

## SUMMARY OF THE INVENTION

The present invention provides a method for producing a polyethylene or polypropylene film having a fragrance and an odor barrier material incorporated into said film, comprising the steps of adding a liquid fragrance to highly porous pellets of polyethylene or polypropylene polymer or co-polymer at a weight ratio of polymer to fragrance of 3:1 and mixing the combination at 30-40 RPM for approximately five to ten minutes. Then, powdered bis fatty-acid amide is added to the above, at a weight ratio of 3-25%, and further mixing is carried out for an additional five minutes. Polyethylene or polypropylene polymer or co-polymer of approximate particle size of 500 $\mu$  is added to the mixture at a ratio of 1:1 by weight, the composition is mixed for two minutes at 60 RPM, and extruded on a single screw extruder. The mixture is formed into pellets, which are mixed with polyethylene or polypropylene polymer or co-polymer at a ratio of 50:1 to 20:1 of polymer to above composition. A film is formed.

Further in accordance with one preferred embodiment the powdered bis fatty-acid amide is selected from the group consisting of lauric acid, myristic acid, palmitic acid, stearic acid, 12-hydroxy-stearic acid, arachidic acid, behenic acid, oleic acid or eruca acid.

Moreover in accordance with one preferred embodiment the powdered bis fatty-acid amide is present at a ratio of 3-25% by weight.

Still further in accordance with one preferred embodiment the fragrance incorporated within said film is of any source, including a natural or artificial fragrance.

The present invention also relates to a plastic film produced according to the above-mentioned method, for either packaging or for masking unpleasant odors, having a fragrance trapped in said film. The plastic film is made from a polyethylene or polypropylene polymer or co-polymer.

In accordance with one preferred embodiment, the plastic film is formed into a

bag useful for packaging or for masking unpleasant odors.

Additionally in accordance with one preferred embodiment, the polyethylene or polypropylene polymer, or co-polymers thereof, in said film is in pellet form.

Additionally in accordance with one preferred embodiment the fragrance incorporated within said film is a combination of more than one fragrance.

Furthermore, in accordance with one preferred embodiment the fragrance incorporated within said bag has the smell of talcum powder.

#### DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In the present invention, a fragrant film can be produced using either polyethylene or polypropylene. A highly porous polymer or co-polymer in pellet form is used, having a void volume of 30-80% and a bulk density of  $350 \text{ kg/m}^3$ . The polymer is mixed in a Henschel-type mixer with a liquid fragrance at a weight ratio of polymer to fragrance of 3:1. Mixing is carried out at 30-40 RPM for five to ten minutes, at 20-25°C (room temperature). Fragrance is absorbed in the porous polymer by capillary force. Fragrance used emitted the smell of talcum powder.

Powdered bis fatty-acid amide is then added at a ratio of 3-25% by weight to the above composition, and mixed for an additional five minutes. The waxy nature of the bis fatty-acid amide prevents premature evaporation of the fragrance during processing and prolongs the shelf-life of the fragrance in the end product to be at least six months. The bis fatty-acid amide also acts as an odor barrier, preventing the escape of foul odor of the waste material to be stored inside the film. The powdered bis fatty-acid amide is based on one of the following: lauric acid, myristic acid, palmitic acid, stearic acid, 12-hydroxy-stearic acid, arachidic acid, behenic acid, oleic acid or eruca acid. Polymer with an approximate particle of  $500\mu$  is then added at a ratio of 1:1 with the above mixture. The entire composition is mixed for an additional two minutes at 60 RPM, then extruded on a single-screw extruder and formed into pellets. The product is then referred to as a "master batch" which can be used to produce polyethylene or polypropylene films, to be applied for use as, for example, a fragrant plastic bag used for masking unpleasant odors. The ratio of polyethylene or polypropylene to "master batch" is between 50:1 to 20:1.

## CLAIMS

- 1) A method for producing a polyethylene or polypropylene plastic film having a fragrance and an odor barrier material incorporated into said film, comprising the steps:
  - a) adding a liquid fragrance to highly porous pellets of polyethylene or polypropylene polymer or co-polymer at a weight ratio of polymer to fragrance of 3:1;
  - b) blending said mixture at 30-40 RPM for approximately five to ten minutes;
  - c) adding powdered bis fatty-acid amide at a weight ratio of 3-25%, to the above mixture;
  - d) blending the mixture for an additional five minutes;
  - e) adding polyethylene or polypropylene polymer or co-polymer, of approximate particle size of 500 $\mu$  at a ratio of 1:1 by weight, to the above composition;
  - f) blending the mixture for two minutes at 60 RPM;
  - g) extruding the resultant composition on a single screw extruder;
  - h) forming the composition into pellets;
  - i) mixing said pellets with polyethylene or polypropylene polymer or co-polymer at a w/w ratio of 50:1 to 20:1 of polymer to above composition;
  - j) forming a film from said pellets.
- 2) A method according to claim 1, wherein the powdered bis fatty-acid amide is selected from the group consisting of lauric acid, myristic acid, palmitic acid, stearic acid, 12-hydroxy-stearic acid, arachidic acid, behenic acid, oleic acid or eruca acid.
- 3) A method according to claim 1, wherein the powdered bis fatty-acid amide is present at a ratio of 3-25% by weight.
- 4) A method according to claim 1, wherein the fragrance incorporated within said

film is of any source, including a natural or artificial fragrance

- 5) A plastic film produced according to the method as defined in claim 1, for packaging or for masking unpleasant odors, comprising a polyethylene or polypropylene plastic film having a fragrance incorporated in said film.
- 6) A plastic bag, for either packaging or for masking unpleasant odors, comprising a polyethylene or polypropylene plastic film as defined in claim 5.
- 7) A plastic film according to claim 5, wherein the polyethylene or polypropylene polymer or co-polymers thereof, from which the film is formed, is in pellet form.
- 8) A plastic film according to claim 5, wherein the fragrance incorporated within said film is a combination of more than one fragrance.
- 9) A plastic film according to claim 5, wherein the fragrance incorporated within said film has the smell of talcum powder.